The Accident at Norwood Junction & its Aftermath

By Jeremy Clarke

This station, at first named "Jolly Sailor" from a nearby canal tavern, is 8 miles and 55 chains from London Bridge. It has occupied its present position since 1859 when it was moved about 80 yards south of the original site. Immediately north of the station the line passes over Portland Road.

At first this street was crossed on the level, but a low bridge was put in to take the road beneath the railway when the London & Croydon's new bi-directional single "atmospheric" line came into use on 19 Jan., 1846.

The bridge consisted of cast iron trough girders of some 20' span and no trouble had been experienced with it until 1 May, 1891. On that day the prestigious 8:45 a.m. up business train left Brighton behind "Gladstone" class 0-4-2 no 175 "Hayling," under the charge of the very experienced driver Hargreaves. It was made up of 15 vehicles. In order from the engine these were a four-wheel brake van, four first class six-wheelers, two bogie firsts, the Pullman car "Jupiter," three bogie firsts, two four-wheel brake vans, two firsts, one six-wheel, and one bogie.

The last three vehicles, destined for Victoria, were "slipped" at East Croydon and a few minutes later the train, now accelerating from the speed restriction imposed there, roared through Norwood Junction. But as "Hayling" crossed the Portland Bridge she began to plunge about, clearly off the road.

Driver Hargreaves made a full emergency brake application, the powerful Westinghouse air brake bringing the train to a stand in almost its own length and undoubtedly averting a major disaster. The entire train was derailed but upright and relatively undamaged. The last vehicle of the train, the rear brake van, was the only vehicle not to reach safety, hanging through the gap until the coupling broke and it landed in the roadway. The carriage ends received a battering where buffer locking had occurred though the frames of the last coach were broken but not separated from the body. Only five passengers complained of injury. Hargreaves and his fireman were both financially rewarded by the company for the prompt action taken.

On inspection it was found the failed cast-iron girder had broken either as the preceding train left the bridge or as "Hayling" ran on to it. The Inspecting Officer, Major-General Hutchinson, reported that the girder had been in place for 31 years, but throughout that time had contained a flaw in the lower flange and the web that was invisible to inspection and, he estimated, reduced its strength by a quarter. But he also pointed out that even had girder been sound its margin of safety was insufficient for the weight of locomotive now using the line. (The 'Gladstone's weighed 38 tons 14 cwt in working order, the leading axle carrying 13t 16c, the

drivers 14½t, and the trailing axle 10t 8cwt.) He concluded by urging railway companies to look to replace cast iron girders with those of wrought iron.

The use of cast iron in a suspended girder had first been queried following the collapse of Robert Stephenson's bridge over the River Dee at Chester on 24 May 1847. But with metallurgy still in its infancy, the basic design was blamed rather than the material. A similar conclusion followed the terrible Tay Bridge disaster of 28 Dec. 1879. In this case, however, the question of generally inferior materials, lax supervision in almost all respects during construction, subsequent woeful maintenance, and the ignoring in the design of the stress on the structure caused by the high winds that constantly beset the Tay estuary all overbore any in-depth analysis of the weakness of cast iron under any force other than compression. But the Norwood accident put it firmly in the dock.

The Brighton instructed its Consulting Engineer, Sir John Fowler, to examine and report on all the company's cast iron bridges. The findings were damning. Fowler recommended the complete reconstruction of 20 bridges within 12 months and another 60 as soon as possible thereafter. The Brighton faced a bill in excess of £100,000 for the work. Other companies followed the Brighton lead, the Midland in particular finding itself with no fewer than 181 bridges that needed some form of rebuilding. The cost here was set at about £85,000.

Thus a relatively insignificant accident at a relatively insignificant LBSCR line station had the most significant countrywide effect on railway safety. Cast iron is still used in construction, but our closer understanding of its properties, going back to that first day of May 1891, has ensured it is utilised only where it is safe to do so.